REMARKS

Claim amendments

Applicant amends the independent claims to include the limitation that the shaft extend across the rotor assembly.

Certain dependent claims are amended to supply missing antecedent basis.

Section 102 rejection

In response, to the section 102 rejection, Applicant amends the claims to recite a shaft that extends across the rotor assembly.

Gamble teaches a motor having a driven end shaft **12** and a non-driven end shaft **13** that are separated from each other by a gap. These end shafts **13**, **16** are maintained at ambient temperature. A rotor assembly **11**, which is maintained at cryogenic temperatures, bridges the gap between the end shaft **13**, **16**.

Because the end-shafts **13**, **16** do not extend across the rotor assembly, there is less opportunity for heat transfer between the warm end shafts **13, 16** and the cold rotor assembly **11**. However, because it lacks a continuous shaft that extends across the rotor assembly, the *Gamble* motor can be difficult to align.

Applicant's claims, as amended, recite a motor in which a continuous shaft extends across the rotor assembly. This continuous shaft facilitates alignment of the motor. The cantilevered member recited in the claims enables transfer of torque to the continuous shaft without excessive heat transfer between the warm shaft (which is in a non-cryogenic region) and the cold support structure and superconducting winding (which are in a cryogenic region).

Gamble thus fails to teach or suggest the claim limitations recited in the amended independent claims. Accordingly, Applicant requests reconsideration and withdrawal of the section 102 rejection of claims 1-8, 11-12, 14-16, 25-30, 32-33, and 35-36.

Section 103 rejections

Claims 9, 10, 13, and 31 are rejected as being rendered obvious by the combination of *Gamble* and *Litz*. Claims 17-24 and claim 34 are rejected as being rendered obvious by *Gamble*.

The foregoing claims are dependent on the independent claims 1, 25, and 36. To the extent those independent claims are allowable, the foregoing dependent claims are likewise allowable. Accordingly, Applicant requests reconsideration and withdrawal of the section 103 rejection.

Objection to Drawings

The drawings are objected to under 37 CFR 1.83(a) because they allegedly fail to show every feature specified in the claims. In particular, the drawings allegedly do not show the cryogenic region and the non-cryogenic region.

The cryogenic region and the non-cryogenic region themselves are not structural features recited in the claim. They are irregularly shaped empty spaces that contain certain structural features within them. It is these structural features that are recited in the claim and that fall within Rule 1.83. Being empty spaces, the cryogenic and non-cryogenic regions are not readily drawn. However, the structural features that they contain within them can be drawn, and are in fact shown in the drawings.

As discussed in the specification, the superconducting windings **40** and the support member **20** are maintained at cryogenic temperatures. These structures, which are within the "cryogenic region," are shown in one or more of the figures. The specification also refers to the shaft **50**, end plate **90**, and sleeve **110** as being maintained at ambient temperatures. These structures, which are within the "non-cryogenic region," are likewise shown in one or more of the figures.

Section 112 rejections

Claims 1-36 stand rejected under 35 USC 112, first paragraph because the non-cryogenic region and the cryogenic region are allegedly not shown in the figures.

As discussed above, the cryogenic region and the non-cryogenic region are voids, not structural features. Being voids, they cannot readily be drawn. Nevertheless, the various structures that fill these voids are identified within the specification. These structures collectively define the locations of cryogenic and non-cryogenic regions in the drawings.

The manner in which the cantilevered member extends between a cryogenic region and a non-cryogenic region is taught, for example, on page 7, lines 8-10 in which the torque tube is described as extending between a warm part of the rotor (i.e. shaft **50**) and a cold part (i.e. support member **20**) of the rotor. The drawings are replete with examples of a cantilevered member extending between a structure that is within a cryogenic region and a structure that is within a non-cryogenic region.

For example, in FIG. 2 and 2A a cantilevered torque tube **30** is shown as extending between the support structure **20** and the end plate **91**. We know from the specification that the support structure **20** is maintained at cryogenic temperatures and that the end plate **91** is at ambient temperature. Therefore, we know that the support structure **20** must be within a cryogenic region and that the end plate **91** must be within a non-cryogenic region. Since the torque tube extends between the support structure and the end plate **91**, it follows that the cantilevered torque tube **30** must also extend between a cryogenic region and a non-cryogenic region as specified by the claims.

In FIG. 3 and 3A, the torque tube **30** extends between the support structure **20** and the magnetic sleeve **110**. Since we know from the specification that the magnetic sleeve **110** is at non-cryogenic temperatures, we know that it must be in a non-cryogenic region. Therefore, FIGS. 3 and 3A provide another example of a cantilevered member extending between a non-cryogenic and cryogenic region as specified in the claims.

Applicant submits that the specification and drawings taken together make it clear to one of ordinary skill in the art precisely what is being claimed. Accordingly, Applicant requests reconsideration and withdrawal of the section 112 rejection of the claims.

Summary

Now pending in this application are claims 1-36, of which claims 1, 25, and 36 are independent. No additional fees are believed to be due in connection with the filing of this response. However, to the extent that fees are due, or if a refund is forthcoming, please adjust our deposit account 06-1050.

Attached is a marked up version showing changes made to the application. Applicant asks that all claims be allowed.

Respectfully submitted,

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Faustino A. Lichauco
Reg. No. 41,942

Fish & Richardson P.C.
225 Franklin Street
Boston, Massachusetts 02110-2804
Telephone: (617) 542-5070
Facsimile: (617) 542-8906

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Version with markings to show changes made

1. (Amended) A rotor assembly configured to rotate within a stator assembly of a rotating machine having a shaft disposed within a non-cryogenic region of the rotor assembly, the shaft extending across the rotor assembly, the rotor assembly comprising:

at least one superconducting winding assembly positioned within a cryogenic region of the rotor assembly, the at least one superconducting winding assembly, in operation, generating a magnetic flux linking the stator assembly; and

a cantilevered member, mechanically coupled between the at least one superconducting winding assembly and the shaft, the cantilevered member extending between the non-cryogenic region and cryogenic region of the rotor assembly.

9. (Amended) The rotor assembly of claim **8**[~~7~~] wherein the metal comprises Inconel.

25. (Amended) A rotating machine comprising:

a shaft within a non-cryogenic region of the rotating machine;

a stator assembly;

a rotor assembly surrounded by the stator assembly and including:

at least one superconducting winding assembly positioned within a cryogenic region of the rotor assembly, the at least one superconducting winding assembly, in operation, generating a magnetic flux linking the stator assembly; and

a cantilevered member, mechanically coupled between the at least one superconducting winding assembly and the shaft, the cantilevered member extending between the non-cryogenic region and the cryogenic region of the rotor assembly.

the shaft extending across the rotor assembly.

31. (Amended) The rotating machine of claim **30** [~~29~~] wherein the metal comprises Inconel.

36. (Amended) A rotor assembly configured to rotate within a stator assembly of a rotating machine having a shaft disposed within a non-cryogenic region of the rotor assembly, the shaft extending across the rotor assembly, the rotor assembly comprising:

at least one superconducting winding assembly positioned within a cryogenic region of the rotor assembly, the at least one superconducting winding assembly, in operation, generating a magnetic flux linking the stator assembly; and

means, mechanically coupled between the at least one superconducting winding assembly and the shaft, for transmitting torque to the shaft, the means for transmitting torque extending between the non-cryogenic region and cryogenic region of the rotor assembly, the means for transmitting torque to the shaft including a cantilevered member.